

REMARKS

The Applicants thank the Examiner for the thorough consideration given the present application. The Examiner is advised that a Request for Continued Examination (RCE) is being filed concurrently with this response.

Claims 3-10 and 21-25 are pending. Claims 1, 11-18, and 20 are canceled without prejudice to or disclaimer of the subject matter contained therein. Claims 2 and 19 were previously canceled. Claims 3-10 and 21 are amended, and claims 23-25 are added. Claims 22-25 are independent. The Examiner is respectfully requested to reconsider the rejections in view of the amendments and remarks set forth herein.

Restriction Requirement

The Examiner has made the Restriction Requirement final, and has withdrawn claims 11-20 from further consideration. By this Amendment, Applicants have canceled non-elected claims 11-18 and 20. Claim 19 was previously canceled. Applicants reserve the right to file a divisional application directed to non-elected claims 11-20 at a later date if so desired.

Claim for Priority

The Examiner has not acknowledged the Applicants' claim for foreign priority based on Japanese Patent Application No. 2002-208699 filed on July 17, 2002. Clarification is requested in the next official communication.

Claim Objection

The Examiner has objected to claim 3 as being a substantial duplicate of claim 2. The Applicants assume that the Examiner means that claims 3 and 4 are substantial duplicates.

In order to overcome this objection, Applicants have amended claims 3 and 4 to depend from independent claims 23 and 24 respectively. Reconsideration and withdrawal of this objection are respectfully requested.

Rejections Under 35 U.S.C. §103(a)

Claims 1, 3-8, 10 and 22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Wright (U.S. 2,782,862) in view of Mendham (U.S. 5,269,057),

claim 9 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Wright in view of Mendham, and further in view of Camping et al. (U.S. 2,698,666); and

claim 21 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Wright in view of Mendham and further in view of Platt et al. (U.S. 412, 908).

These rejections are respectfully traversed.

Independent Claims 22, 23, 24, and 25

While not conceding the appropriateness of the Examiner's rejection, but merely to advance prosecution of the instant application,

independent claim 1 is canceled;

independent claim 22 is amended herein to recite a combination of elements directed to a blade member for an airplane, including said outer skin area including said first outer skin, said second outer skin, said leading edge, said trailing edge, and said at least one reinforcing area are integrally formed from a single block;

independent claim 23 is added herein to recite a combination of elements directed to a blade member for an airplane, including said outer skin area including said first outer skin, said second outer skin, said leading edge and said trailing edge and said reinforcing area are integrally formed from a single block by wire electrical discharge-machining, and wherein at least one of wall thickness of said first outer skin and said second outer skin changes in a cord direction;

independent claim 24 is added herein to recite a combination of elements directed to a blade member for an airplane, including said outer skin area including said first outer skin, said second outer skin, said leading edge and said trailing edge and said reinforcing area are integrally formed from a single block by wire electrical discharge-machining; and

independent claim 25 is added herein to recite a combination of elements directed to a blade member for an airplane, including at least a portion of a rotor blade of the airplane and has an asymmetrical cross-sectional shape as viewed in a span direction, said blade member comprising:

an outer skin area elongated in the span direction and surrounded by a first outer skin, a second outer skin, a leading edge and a trailing edge each having a predetermined wall thickness; and wherein said outer skin area including said first outer skin, said second outer skin, said leading edge and said trailing edge and said reinforcing area are integrally formed from a single block by wire electrical discharge-machining.

Support for the novel features and configuration can be seen, for example, in FIG. 1.

First of all, we note that the Examiner still relies on the combination of Wright and Mendham in rejecting the patentability of the subject matter of the independent claims on file. However, the Applicants are of the opinion that the combination completely fails to teach or suggest the gist of the invention, i.e., of providing a blade member for an airplane by using a single block through wire electrical discharge-machining. Based on this understanding, new independent claims 23, 24, and 25 are added.

The primary reference, Wright, exclusively teaches forming a propeller blade by preparing two members 1, 2 of identical configuration or symmetrical with respect to the division line 10, as shown in Fig. 2 thereof. Such symmetrical or identical configuration of two members 1, 2 enables the welding of the two members at the division line 10 to be carried out very reliably. Thus, the art taught in Wright deals with the subject of making the welding operation

between two half members reliable. This art does not take account of a possibility of forming such propeller blade wholly from a single blank material.

The secondary reference, Mendham, teaches use of wire electrical discharge machining in making airfoil components. It should be noted here that in this prior art, the wire electrical discharge machining is used for providing bonding portions (40) of relatively small thickness or dimension between two components. Though Figs. 14 and 15 show elements 36, 36' which are somewhat similar in shape to the blade member of the embodiment of the subject application, they are merely blank members and not a product that has been made as a result of wire electrical discharge machining.

Based on the above-discussed understanding, it is asserted that above all, Wright includes a teaching that would hinder the skilled person from forming a blade member from a single block and that even if the teachings of Mendham are combinable into the art of Wright, what could be obtained from such combination would merely be forming a bonding portion of a member of Wright by using wire electrical discharge machining.

New independent claims define 23, 24 and 25 define the following distinctive aspect over the cited prior art:

Claim 23: This independent claim further defines, in addition to the features of original claim 1, that the outer skin area including the first and

second outer skins, the leading edge and the trailing edge, and said reinforcing area are integrally formed from a single block by wire electrical discharge-machining. This specifically constructed blade member need not be subjected to welding operation since all parts thereof are formed integrally from a single block. The production process for this blade member can therefore be simplified remarkably. Though this merit is associated with the process aspect of the invention, the Applicants believe that new claim 23 can be held as a product claim since it still relates to the structural features as a whole.

Claim 24: This independent claim defines, in addition to the features of the above-mentioned claim 23, that at least one of wall thickness of the first outer skin and the second outer skin changes in a cord direction. This feature is derived from original claim 2. As typically shown in Fig. 1 of the application, the wall thickness of the second outer skin 12 changes in the cord direction, so that the bending rigidity and the torsional rigidity of the blade member for the airplane can be optimized while minimizing the increase in weight. Changing the wall thickness of the outer skin can be easily done in the cord direction by employing wire electrical discharge-machining as required in the claim. Mendham does not teach or suggest anything in this respect.

Claim 25: This independent claim defines, in addition to the features of the above-mentioned claim 23, that the blade member has an asymmetrical

cross-sectional shape as viewed in a span direction and the outer skin area is elongated in the span direction. This feature is derived from the illustration of Fig. 1 of the application and intends to emphasize the distinctive aspect over Wright and Mendham. As discussed above, Wright exclusively teaches use of two half members of identical or symmetrical configuration and this is far away from the subject matter defined in this new claim 25. Mendham does not teach or suggest that a blade member is entirely formed from a single block by wire electrical discharge-machining.

At least for the reasons above, Applicants respectfully submit that the combination of elements as set forth in each of independent claims 22-26 is not disclosed or made obvious by the prior art of record, including Wright and Mendham, at least for the reasons explained above.

Therefore, independent claims 22-26 are in condition for allowance.

Arguments Regarding Dependent Claims 3 and 4

We take this opportunity to further argue the patentability of dependent claims 3 and 4 which recite that a distance between outer surfaces of the first and second outer skins is gradually decreasing toward the trailing edge to become approximately zero at the trailing edge. See the portion 14 in Fig. 1 of the application. Such decreased distance of approximately zero at the trailing edge is possible when using wire electrical discharge-machining. In the case of Wright, two members 1 and 2 are to be welded at the division line 10 and

thus even at the trailing edge, the thickened portion appears or remains by welding. If the two members are to be welded together from inside, for avoiding such inconvenience and making the trailing edge quite sharp, a clearance may in turn be present on the outer side between the two outer skins at the trailing edge, which would undesirably allow invasion of water inside the blade member and accelerate corrosion of the member.

All dependent claims are in condition for allowance due to their dependency from allowable independent claims, or due to the additional novel features set forth therein.

Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. 103(a) are respectfully requested.

CONCLUSION

Since the remaining patents cited by the Examiner have not been utilized to reject claims, but merely to show the state of the art, no comment need be made with respect thereto.

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. It is believed that a full and complete response has been made to the outstanding Office Action, and that the present application is in condition for allowance.

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Amendment dated April 12, 2005
Reply to Office Action of January 12, 2005

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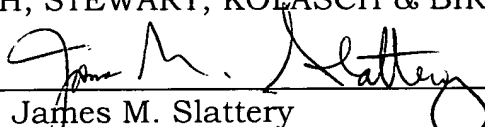
If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, he is invited to telephone Carl T. Thomsen (Reg. No. 50,786) at (703) 205-8000.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17, particularly extension of time fees.

Respectfully submitted,

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